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SYSTEMATIZE STUDENTS' KNOWLEDGE AND INCREASE THE ABILITY OF LOGICAL THINKING THROUGH SOLVING PROBLEMS IN PHYSICS

I Meshboltayev ,
Associate Professor, Department of Physics and Astronomy, Kokand SPI, PhD [1]

SZG'ofurov [2]
Student of the Faculty of Physics and Mathematics, Physics and Astronomy [2]
(tel: +998911558383, E-mail: iqboljon_808@mail.ru)

ANNOTATION
"To systematize students' knowledge and improve their ability to think logically by solving physics problems." In this work, the method of using the interactive method in solving physics problems in general secondary schools is shown. Problem solving is organized step-by-step, and at each step the activity of students individually and in groups is evaluated, and the total score is announced at the end of the lesson.

Keywords: creativity, solving problems in physics, systematizing students' knowledge, increasing the ability to think logically, temperature,

It is important to teach the young generation from school to think independently, to apply the knowledge they have learned, to form creative abilities, and to systematize knowledge. Physics problem-solving exercises are very effective in forming such skills and abilities in students. In the process of solving problems, students' logical thinking expands, their creative abilities develop, and their knowledge is systematized. In problem-solving exercises, students solve the problem set in the problem based on their previous knowledge, as a result of which rules, formulas and rates are repeated. Knowledge is systematized in the analysis of the solution of the problem.

Example: What $-10^0 C$ amount of heat is required to turn ice at a given temperature into steam? $1kg$

In order to solve this problem , we need to systematize the concepts of molecular physics and physical quantities specific to aggregate states (ice, water and steam) in matter.

the ice with a $1kg$ temperature of 1 to the $-10^0 C$ melting temperature $0^0 C$. For this, we need to explain that the specific heat capacity of ice is equal to , this quantity is taken from the table and its physical meaning. $C_m = 2100\frac{J}{kg}$ The amount of heat required to heat ice to its melting temperature is determined as follows:

$$Q_1 = C_m m(t_2 - t_1) = 2100\frac{J}{kg}\cdot 1kg\cdot\left(0^0 c - \left(-10^0 c\right)\right) = 21\cdot 10^3 J$$

ice at the $0^0 C$ melting temperature into $0^0 C$ ice $1kg$ water $1kg$. To do this, we $\lambda = 330\cdot 10^3\frac{J}{kg}$ need to explain the heat of melting of ice, how this quantity is taken from the table, and its physical meaning. That is , we need to explain how much the internal energy of $0^0 C$ ice is different from water and that the $1kg$ melting $1kg$ temperature is equal to the solidification temperature, and the temperature does

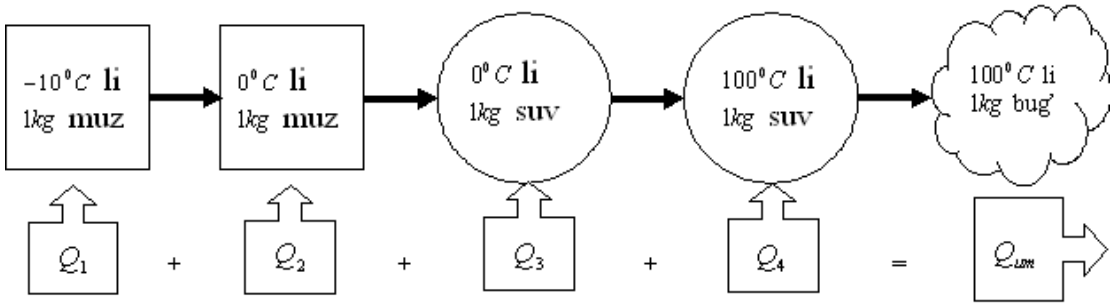
not change until the ice melts completely 0^0C. In order to 0^0C turn $1kg$ ice 0^0C into $1kg$ water, we use heat energy equal to the specific heat of fusion $Q_2 = m\lambda = 1kg \cdot 330 \cdot 10^3 \frac{J}{kg} = 330 \cdot 10^3 J$.

boil $1kg$ water with 3 . 0^0C To do this, we need to explain that the specific heat capacity of water $C_s = 4200\frac{J}{kg \cdot K}$ is equal to , the boiling point is equal to , $t = 100^0C$ and that these quantities are taken from the table and their physical meaning is at normal atmospheric pressure. In this case, the amount of heat used to boil water is $Q_3 = C_s m(t_2 - t_1) = 4200\frac{J}{kg \cdot K} \cdot 1kg(100^0C - 0^0C) = 420 \cdot 10^3 J$ equal to

4 – In this step , we convert 100^0C li $1kg$ water into 100^0C li $1kg$ vapor. For this, we need to explain to the students the physical essence of the fact that the formation of steam for water is $L = 2{,}3 \cdot 10^6 \frac{J}{kg}$ equal to the specific heat, that this quantity is taken from the table, and that the temperature does not change until the water completely turns into steam . We spend energy at this stage . $Q_4 = mL = 1kg \cdot 2{,}3 \cdot 10^6 \frac{J}{kg} = 2300 \cdot 10^3 J$

the $1kg$ ice in the 100^0C final stage into complete -10^0C steam $1kg$, and show the students that the sum of the amounts of heat corresponding to each temperature unit transition is the total energy expended. please, that is:

$$Q_{um} = Q_1 + Q_2 + Q_3 + Q_4 = 21 \cdot 10^3 J + 330 \cdot 10^3 J + 420 \cdot 10^3 J + 2300 \cdot 10^3 J = 3071 \cdot 10^3 J = 3071kJ$$



The issue solve in the process as shown students of substances aggregate cases , this cases internal energy change for necessary has been heat amounts stage stage is studied .

In the process of problem solving, the knowledge acquired by students is reorganized, the activity of several students in solving one problem is increased, the knowledge gained by students is graded, etc. It will be appropriate if the solution of the problem covers the subject of the lesson or some direction of physics. This type of problem solving encourages students to recall and rethink previously covered topics.

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